

Big Data @ EUMETSAT

Paul COUNET
Head of Strategy, Communication
and International Relations



EUMETSAT – an intergovernmental organization with 30 Member States



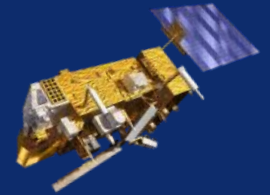
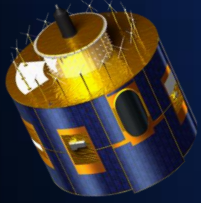
What do we do ?

EUMETSAT delivers **operational** (satellite)
Weather and Climate Data Services to our **user**
organisations : National Meteorological
Services and Forecasting Centres

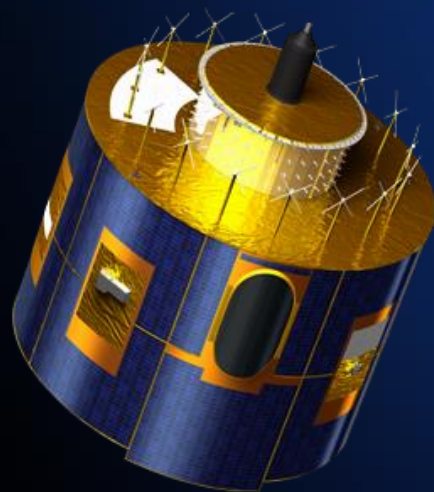


Where are we in the value chain ?

WE ARE HERE !

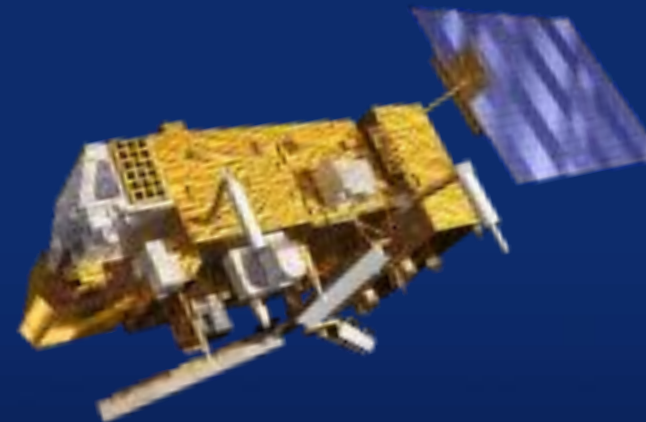


The need for two types of meteorological satellites



Geostationary orbit

Vital for forecasts up to a few hours

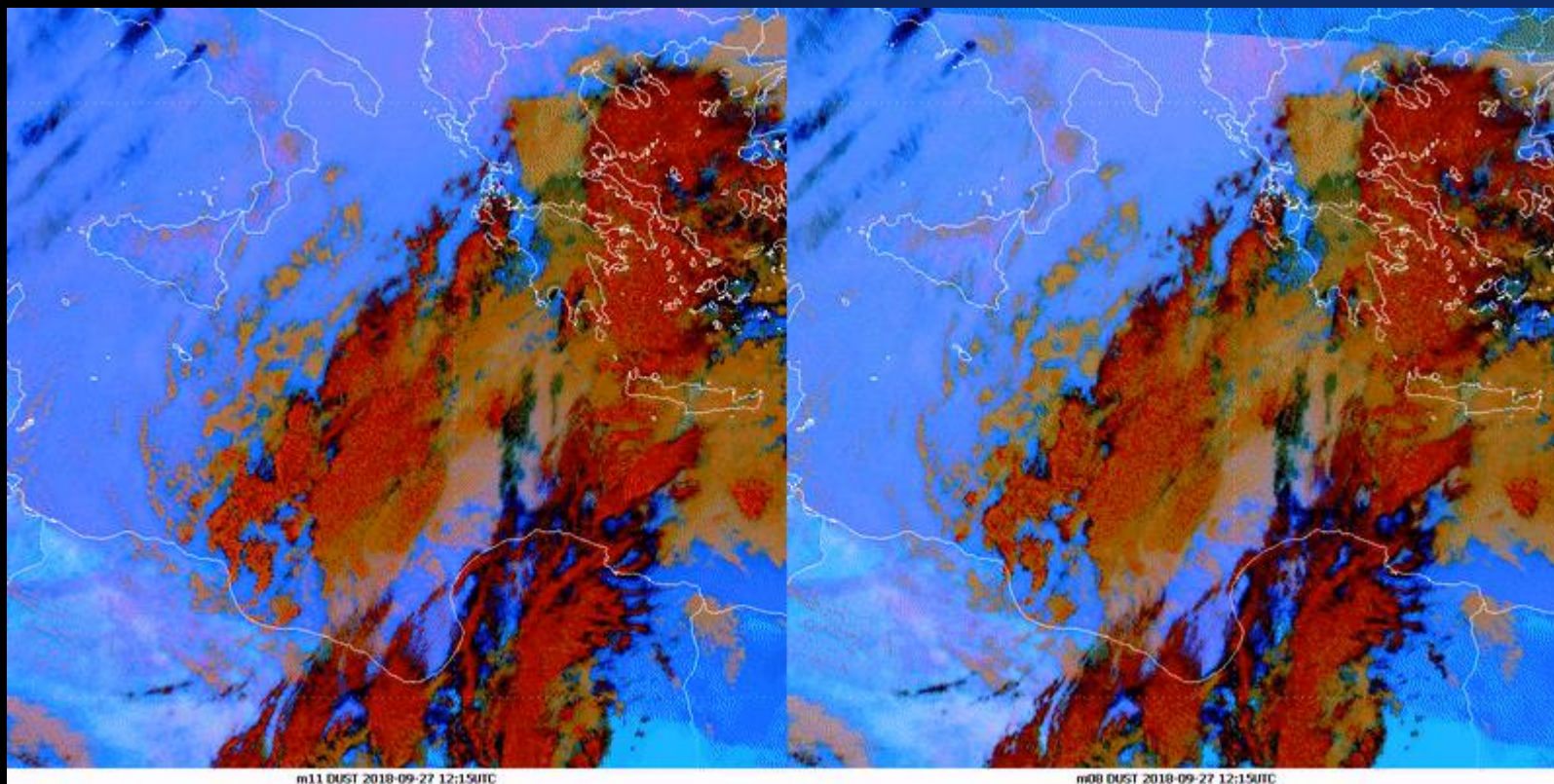


Polar orbit

Critical for forecasts up to 10 days

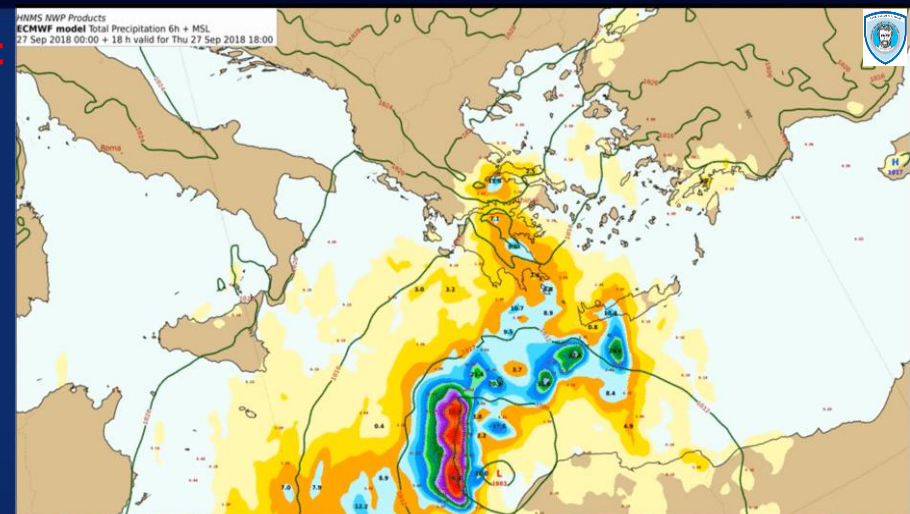
Meteosat monitors Rapid Convection Systems

Medicane Zorba: 28-30 September 2018



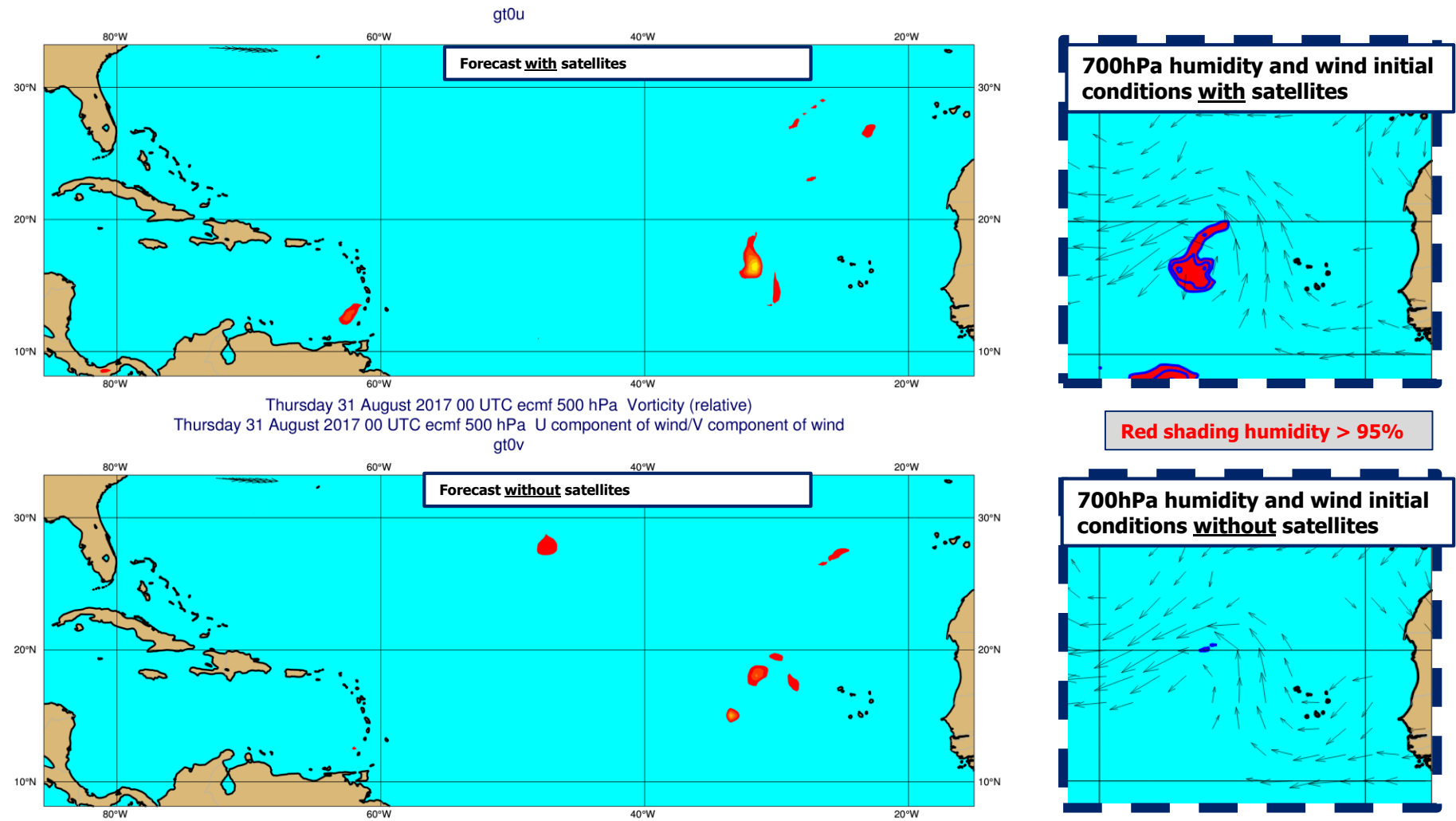
Observations : Meteosat -11 (0°) and Meteosat -8 (41.5°E)

Forecast



Warning

Metop contributes to forecast Hurricanes : IRMA



Source: ECMWF

30 August – 12 September 2017

Prevention for Irma





NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

ANALYSES & FORECASTS • DATA & TOOLS • EDUCATIONAL RESOURCES • ARCHIVES • ABOUT NHC • SEARCH •

Hurricane IRMA

ZCZC MIATCDAT1 ALL
TTAA00 KIHK DDDHHM

Hurricane Irma Discussion Number 26
NWS National Hurricane Center Miami FL AL112017
1100 AM AST Tue Sep 05 2017

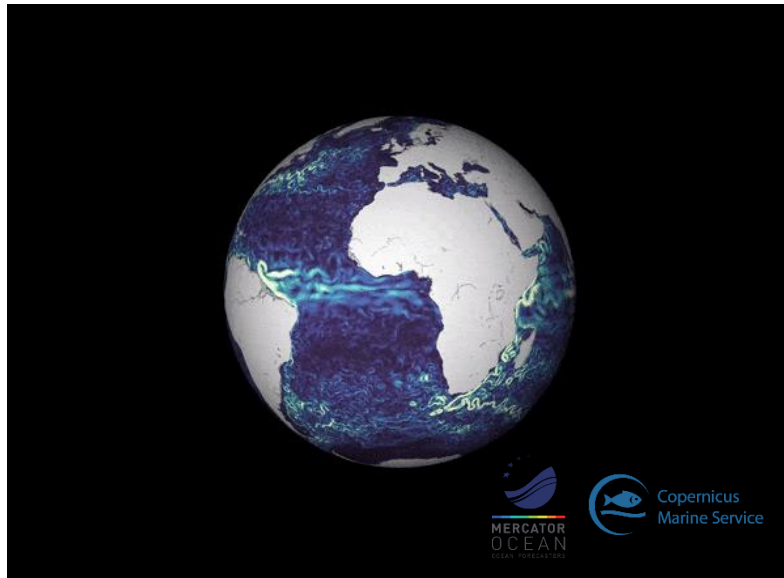
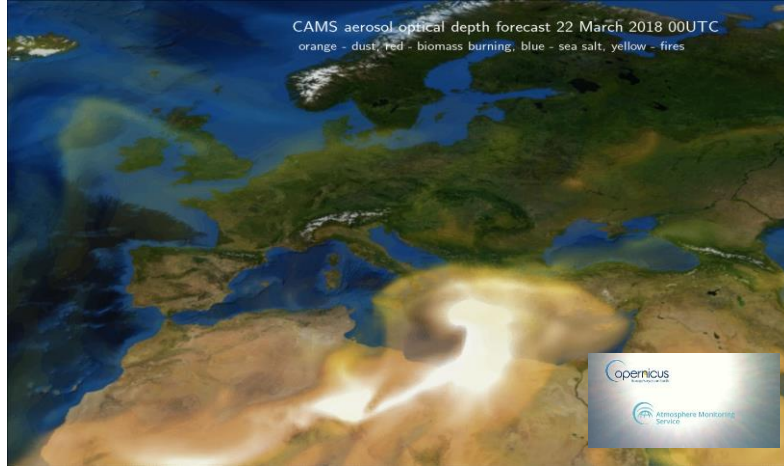
Irma is an extremely impressive hurricane in both infrared and visible satellite images. Experimental GOES-16 one-minute visible satellite pictures show a distinct 25-30 n mi wide eye with several mesovortices rotating within with eye. The aircraft have not sampled the northeastern eyewall where the strongest winds were measured shortly before 1200 UTC this morning, but the Air Force plane will be entering the eye in that quadrant momentarily. A peak SPMR wind of 154 kt was reported, with a few others of 140-150 kt. Based on these data the initial intensity is set at 155 kt for this advisory. This makes Irma the strongest hurricane in the Atlantic basin outside of the Caribbean Sea and Gulf of Mexico in the NHC records.

Irma is expected to remain within low vertical wind shear, a moist mid-level atmosphere, and high upper-ocean heat content as it moves west-northwestward during the next several days. These conditions should allow the hurricane to remain very intense throughout much of the forecast period, however, fluctuations in intensity are likely to occur as eyewall replacement cycles take place. The NHC intensity forecast is near the upper-end of the guidance and assumes little overall interaction of Irma with the islands of the Greater Antilles.

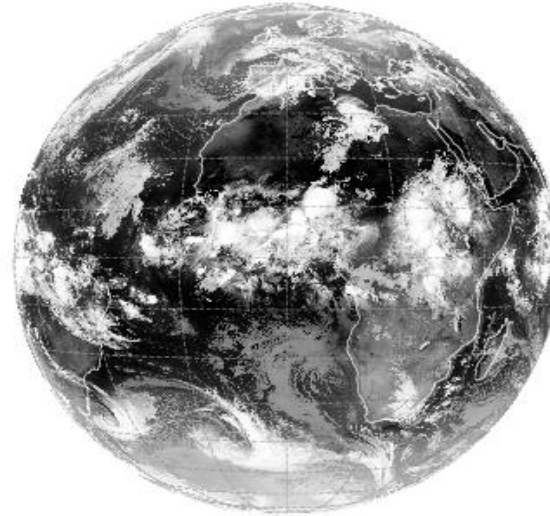
Irma continues to move westward at about 12 kt, and a strong subtropical ridge centered over the central Atlantic should steer Irma generally westward today. The ridge is expected to remain in place over the western Atlantic during the next several days and Irma is forecast to move west-northwestward throughout the most of remainder of the forecast period. Around day 5, a shortwave trough dropping southward over the central United States is expected to begin eroding the western portion of the ridge, allowing a Irma to gain some latitude. The new NHC track forecast is close to the HFIP corrected consensus model and is very similar to the previous forecast.

Since Irma is a large hurricane, users are reminded to not focus on the exact forecast track since tropical-storm and hurricane-force winds and life-threatening storm surge extend far from the center. Residents in the Leeward Islands should complete their preparations very soon as the weather will begin to deteriorate over the easternmost Leeward Islands later this afternoon.

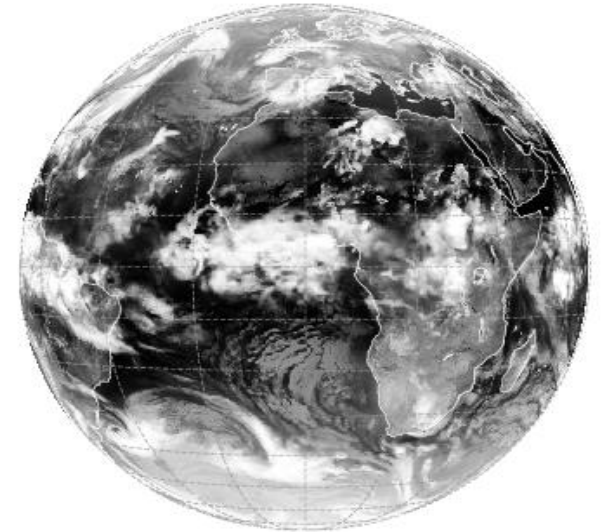
From weather to environmental forecasting : COPERNICUS



Meteosat 9 IR10.8 20080525 0 UTC

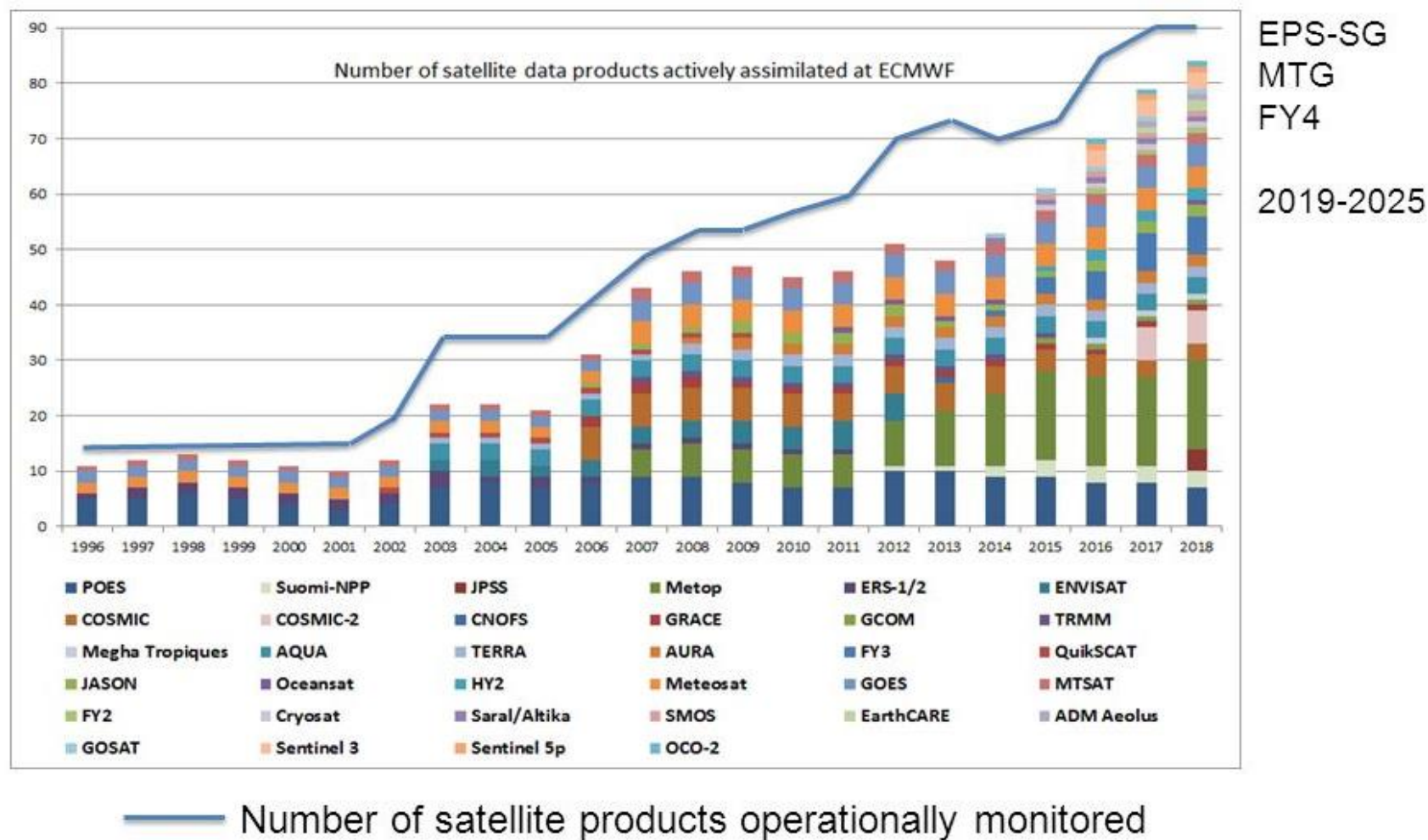


ECMWF Fc 20080525 00 UTC+0h:

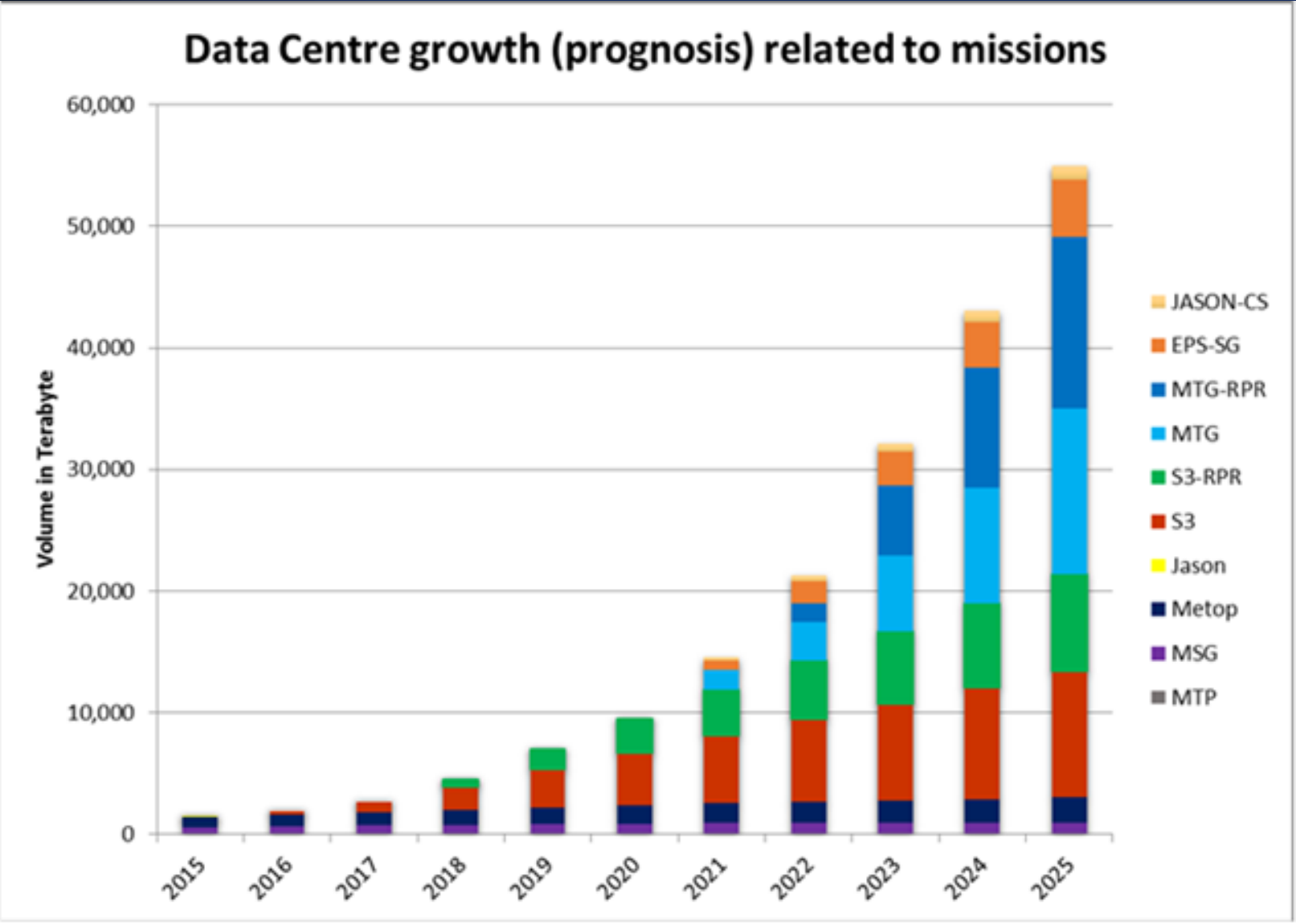


 **Copernicus**
Europe's eyes on Earth

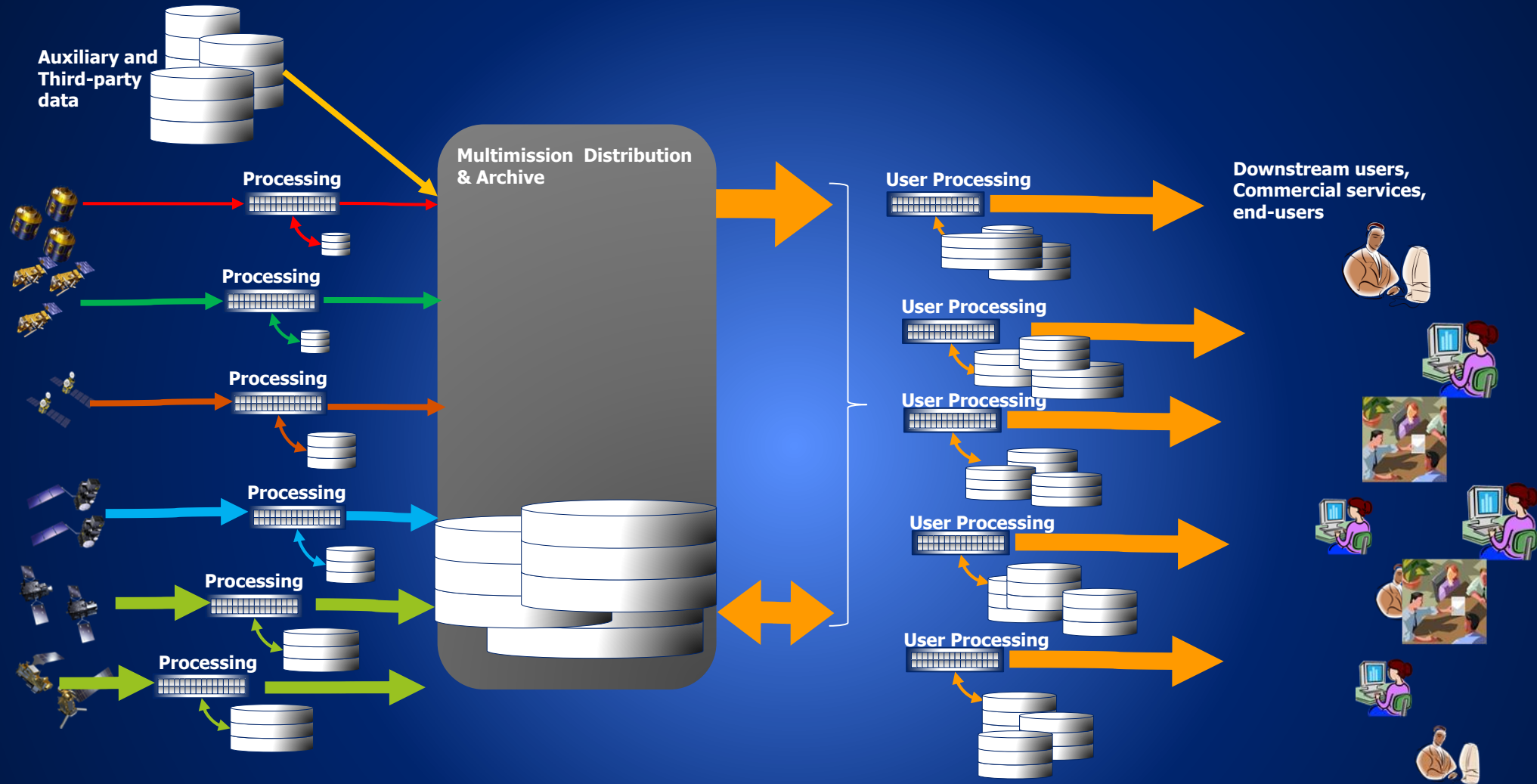
Explosion of use of Satellite Data in NWP



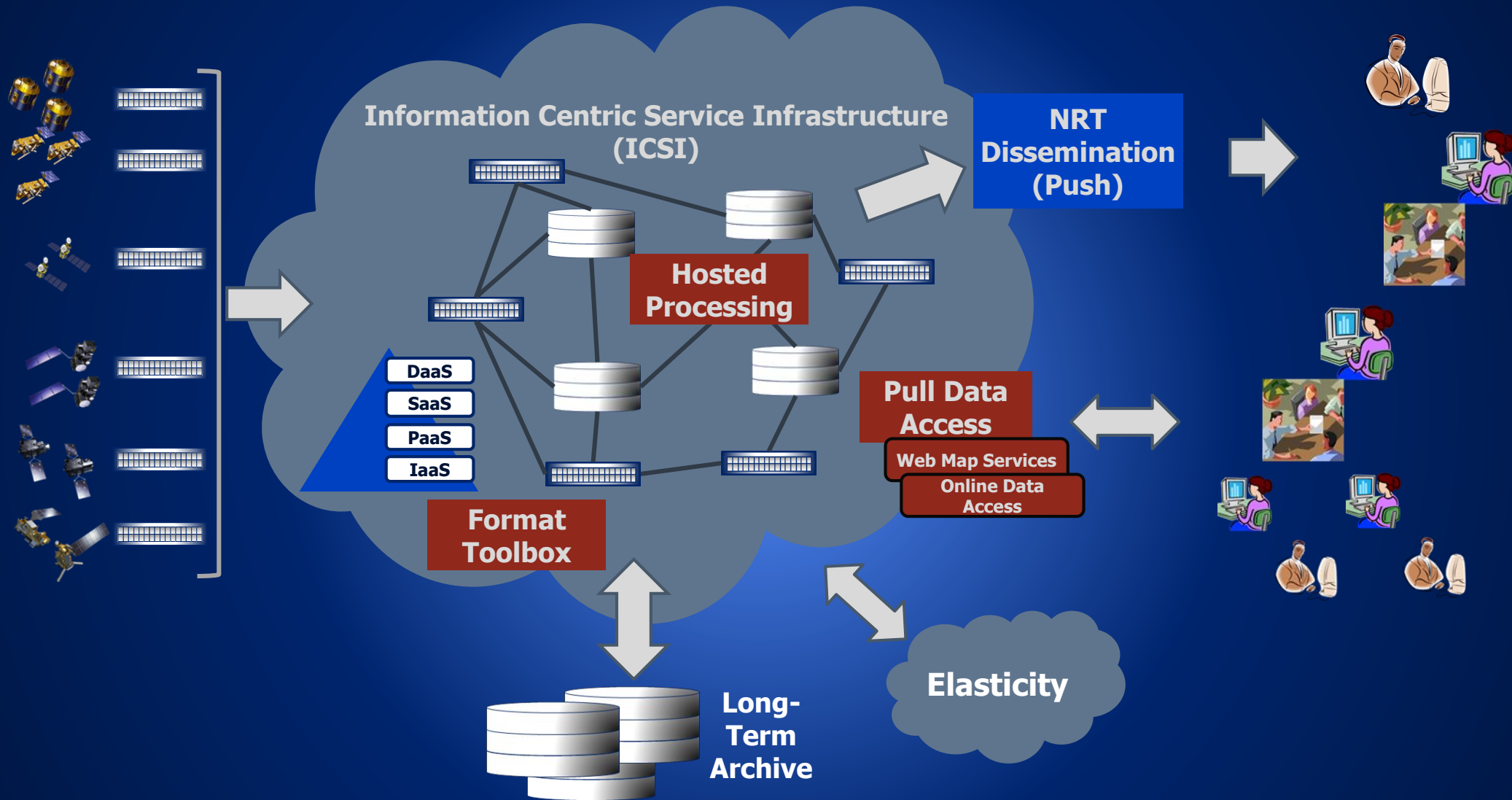
Planned growth of EUMETSAT Data Centre



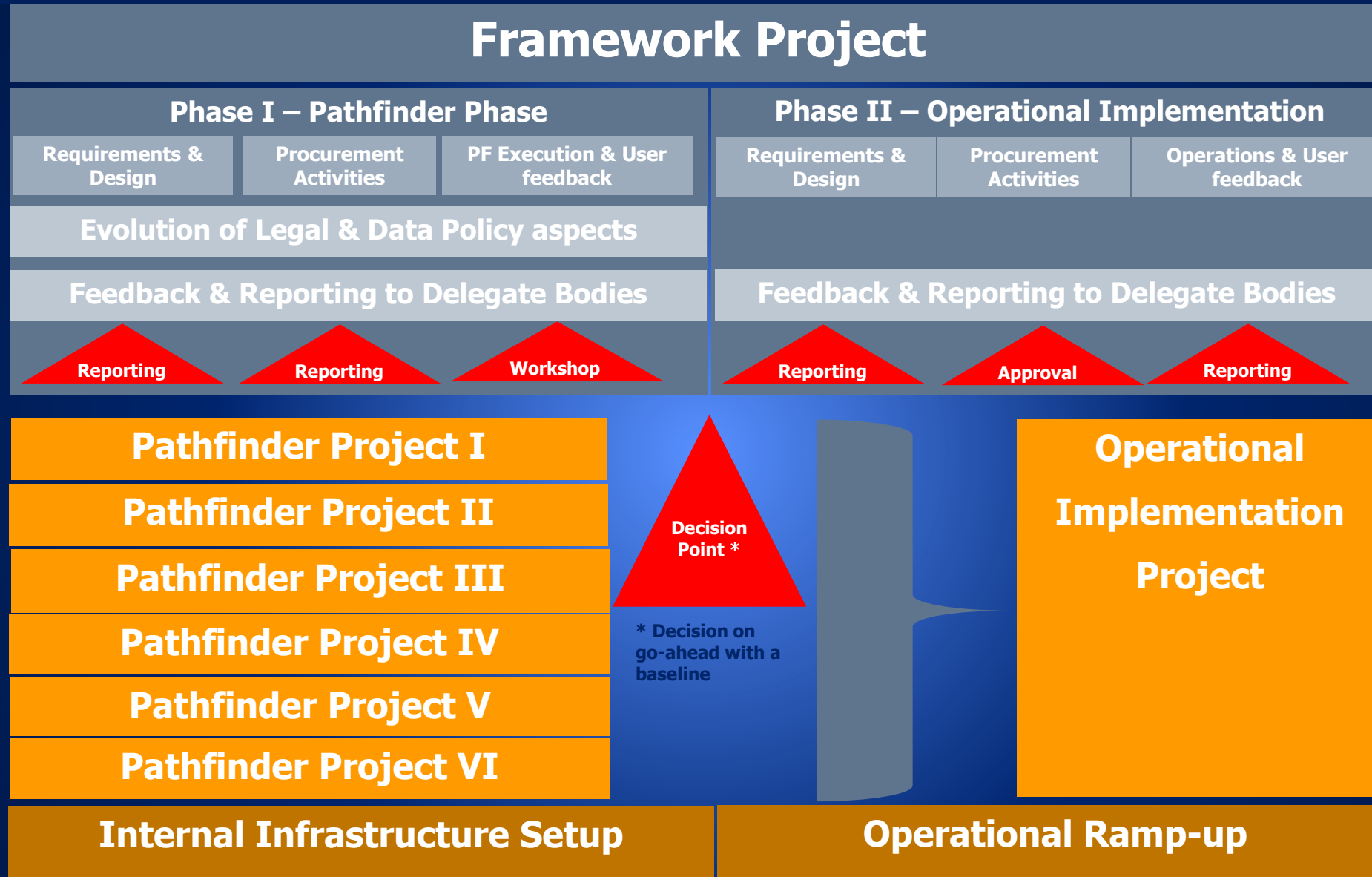
Starting Point: Current paradigm



The Initial Concept tested through Pathfinders ...

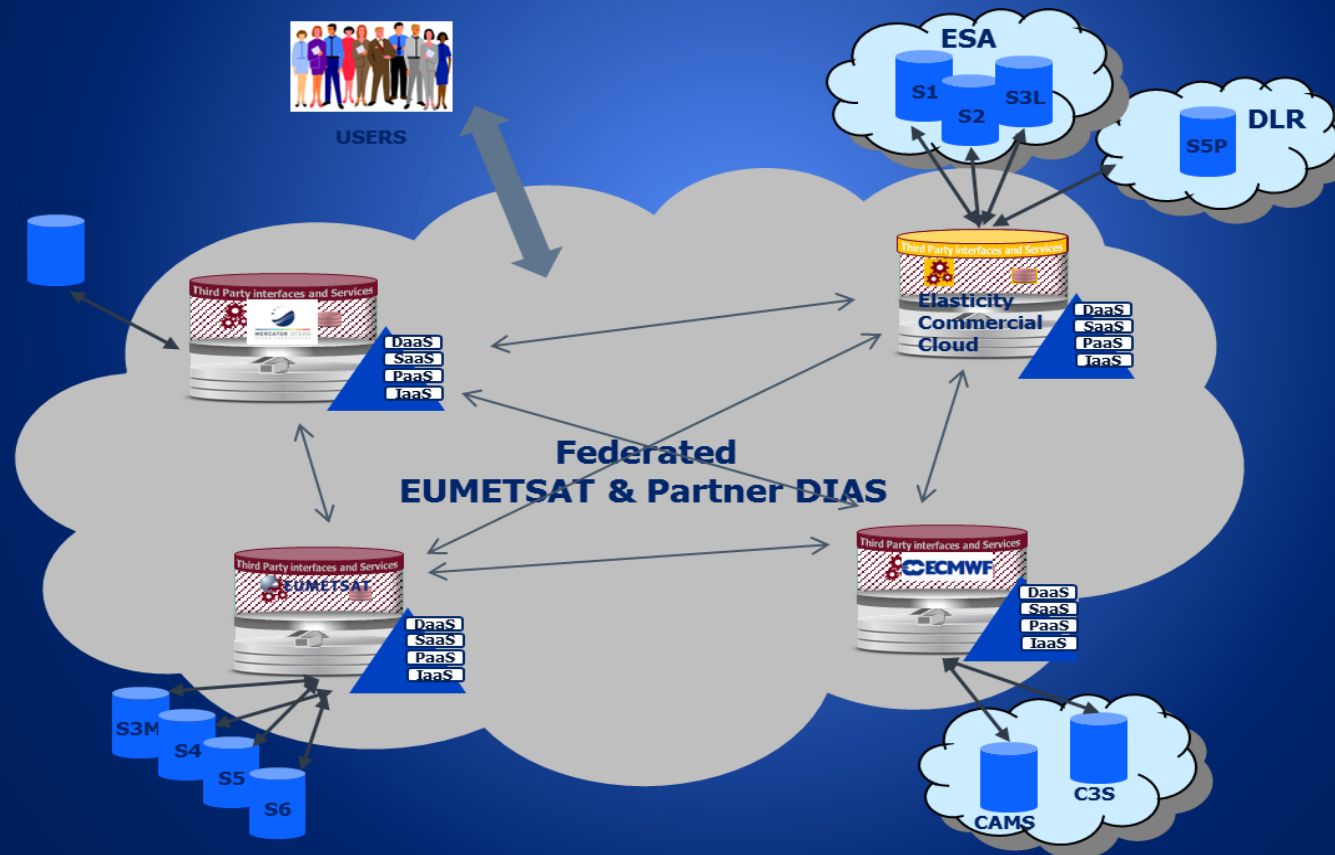


End to end logic of EUMETSAT Pathfinders



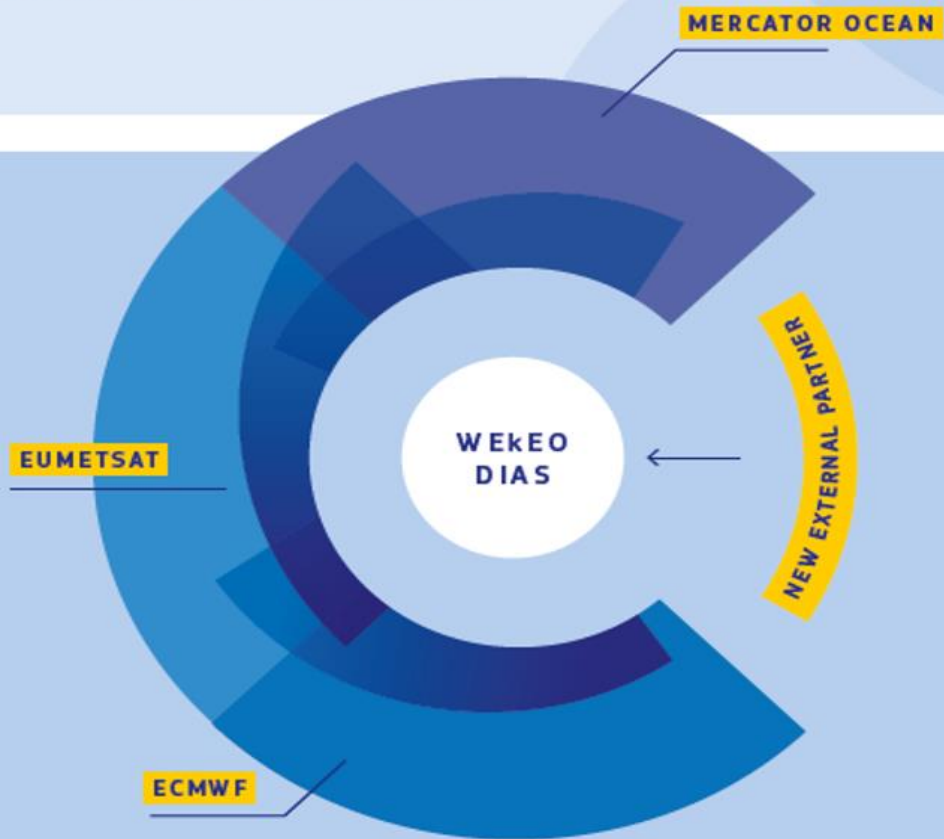
Copernicus DIAS – The idea

- Providing Sentinel Satellite Data + Model Data + Copernicus Services Data → strongly increased Value, Interest for uptake.
- Using cloud federation capability developed during pathfinders → EUMETSAT with Partners ECMWF and Mercator-Ocean proposed a federated DIAS



WEkEO : A Copernicus DIAS

A DISTRIBUTED INFRASTRUCTURE



The Most up-to-date Copernicus Data & An Expanding Data Offer in the future.

➔ **WEkEO's distributed infrastructure relies on the Copernicus organisation already in place in the 3 centers :** infrastructure and data from the 3 centers are not duplicated but rather linked together, reducing costs for the European tax payer and avoiding the need for new energy-consuming infrastructure.

➔ This approach gives users direct access to work with the **most up-to-date Copernicus data** instead of having to rely on copied, archive datasets.

➔ Finally, this federative approach can be extended to other selected external partners, so the system has the **potential to continually grow and expand in the future.**

Conclusions

- Major Evolution towards digitalization → Positive lessons learned with „Orientation“ & „Pathfinders“. This is important to continue to guarantee an operational service. Important: involve all sectors (Admin, Operations, Technical, etc..)
- In the past, commercial exploitation was downstream, along the data path → Redefined limits of the „public Sector“: publicly-funded services & commercial exploitation coexist on same platform. DIAS is a good example in our specific case.
- Single Cloud solution not necessarily sufficient:
 - Data/Information Sources/Knowledge are distributed, and will remain so;
 - Commercial cloud solutions remain expensive + risk of lock-in
 - Mix of private + public cloud (elasticity)
- Federative approach, respecting the identity of contributors, fits well to our needs → will be further developed and offered to our Member States